What is claimed is:

1. A circuit having a fingerprint for identification of a particular instantiation of said circuit, the circuit comprising:

i. a plurality of digital circuits or gates, the plurality of digital circuits or gates each having an analog input and wherein each of said digital circuits or gates has at least one functional state wherein the corresponding digital circuit or gate performs an intended digital function and at least one other state wherein said intended digital function is not performed, each of said digital circuits or gates being responsive to a configuration voltage applied to its analog input for controlling whether or not said digital circuit or gate performs its intended digital function, each of said digital circuits or gates transitioning between its functional state and its at least one other state when the configuration voltage corresponds to a boundary voltage, the boundary voltages varying between different instantiations of said circuit for at least one, but preferably many, of said digital circuits or gates; and

ii. a plurality of digital to analog converters for generating configuration voltages each applied to one or more of said plurality of digital circuits or gates.

2. The circuit of claim 1 wherein manufacturing tolerances occurring during manufacture of said circuit give rise to the varying of said boundary voltages.

3. The circuit of claim 1 wherein at least some of the plurality of digital circuits or gates comprise polymorphic circuits, wherein each polymorphic circuit has at least two functional states, one functional state corresponding to said intended digital function and the at least a second functional state corresponding to another reliable digital function for said circuit, each polymorphic circuit further having at least one additional non-functional state occurring between said two functional states as a function of its configuration voltage so that each polymorphic circuit has an associated plurality of boundary voltages where the polymorphic circuit shifts between a functional state and a non-functional state.

4.   The circuit of claim 3 the polymorphic circuits have at least five boundary voltages where the polymorphic circuit shifts between a functional state and a non-functional state.

5.   The circuit of claim 4 wherein each boundary voltage of a particular polymorphic circuit corresponds to a number applied to an associated digital to analog converter for generating a corresponding configuration voltage corresponding to each boundary voltage associated with said particular polymorphic circuit.

6.   The circuit of claim 1 wherein the boundary voltage of a particular digital circuit or gate corresponds to a number applied to an associated digital to analog converter for generating a corresponding configuration voltage corresponding to the boundary voltage associated with said particular digital circuit or gate.

7.   The circuit of claim 1 wherein said circuit is an integrated circuit device.

8.   A circuit having a fingerprint for identification of a particular instantiation of said circuit, the circuit comprising:

a plurality of digital circuits or gates, each of said digital circuits or gates having at least one functional state wherein the corresponding digital circuit or gate performs an intended digital function and at least one other state wherein said intended digital function is not performed, each of said digital circuits or gates being responsive to a configuration parameter applied thereto for controlling whether or not said digital circuit or gate performs its intended digital function, each of said digital circuits or gates transitioning between its functional state and its at least one other state when the configuration parameter corresponds to a boundary condition, the boundary conditions varying between different instantiations of said circuit for at least one, but preferably many, of said digital circuits or gates due to manufacturing tolerance related reasons, the varying boundary conditions constituting said fingerprint; and

an electrical circuit for testing the boundary condition and thereby extracting said fingerprint from said particular instantiation of said circuit.

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9.   The circuit of claim 8 wherein said circuit is an integrated circuit device.

10.   The circuit of claim 9 wherein the configuration parameter is selected from the group consisting of: a DC voltage applied to or within said integrated circuit device, an AC voltage applied to or within said integrated circuit device, a pressure applied externally of said integrated circuit device, a current applied to or within said integrated circuit device, a temperature of said integrated circuit device, ionizing radiation impinging said integrated circuit device or combinations of the foregoing.

11.   A method of uniquely identifying instantiations of functionally equivalent circuits comprising:

        representing small manufacturing tolerance related-differences between particular instantiations of the functionally equivalent circuits as a plurality of multi-bit numbers, each multi-bit number being associated with a particular gate or a group of gates of an instantiation of said functionally equivalent circuits;

        determining said multi-bit numbers for a particular instantiation of said functionally equivalent circuits, said multi-bit numbers serving to uniquely identify said particular instantiation of said functionally equivalent circuits from other instantiations of said functionally equivalent circuits;

        storing the multi-bit numbers for said particular instantiation of said functionally equivalent circuits;

        installing said particular instantiation of said functionally equivalent circuits in a particular item of equipment; and

        thereafter testing said particular item of equipment for a presence of said particular instantiation of said functionally equivalent circuits in said particular item of equipment by determining said multi-bit numbers for the instantiation of said functionally equivalent circuits in said particular item of equipment and comparing the results of said last mentioned determination of said multi-bit numbers with the stored numbers corresponding to the particular instantiation of said functionally equivalent circuits originally installed in said particular item of equipment.

12.   The method of claim 11 wherein said instantiations of functionally equivalent circuits each comprise a separate instantiation of an integrated circuit device.

13.   The method of claim 12 wherein each multi-bit number is associated with a gate or a group of gates, said gate or group of gates being functionally configured by an analog control or configuration signal generated by a DAC responsive to the multi-bit number associated with said gate or group of gates.

14.   A method of uniquely identifying instantiations of functionally equivalent circuits comprising:

representing small manufacturing tolerance related differences between particular instantiations of the functionally equivalent circuits as a plurality of multi-bit numbers, each multi-bit number being associated with a particular polymorphic circuit or particular group of polymorphic circuits of an instantiation of said functionally equivalent circuits; and

determining said multi-bit numbers for a particular instantiation of said functionally equivalent circuits, said multi-bit numbers serving to uniquely identify said particular instantiation of said functionally equivalent circuits from other instantiations of said functionally equivalent circuits.

15.   The method of claim 14 wherein said instantiations of functionally equivalent circuits each comprise a separate instantiation of an integrated circuit device.

16.   The method of claim 15 wherein each said particular polymorphic circuit or particular group of polymorphic circuits is functionally configured by an analog control or configuration signal generated by a DAC responsive to the multi-bit number associated with said said particular polymorphic circuit or particular group of polymorphic circuits.